7 LENS MONITORING FUNCTION (FOR 4.0 kW OR HIGHER ONLY)

7-1 Outline

If dust or any other foreign material dropped on the focus lens is burned by a laser beam, this function detects the light emitted at that time using an optical sensor, and stops the emission of a laser beam to minimize the risk of burning of the lens and fouling of the mirror in the external optical path. During cutting operations, this function always keeps watch on the upper surface of the lens.

7-2 Specifications

7-2-1 Detection of the burning of dust or the like

The intensity of the visible light emitted when dust or the like burns is detected with an optical sensor used in IMS (Intelligent Monitoring System).

7-2-2 Control

If the intensity of the light emitted when dust or the like burns on the upper surface of the lens exceeds the threshold value for a specified period of time, the feeding of material and the emission of a laser beam will be stopped with an alarm.

- In both manual and automatic modes, the lens monitoring function works when a laser beam is emitted (shutter opened and electric discharge ON).
- If something unusual is detected, the alarm **1708 LENS ALARM** will be displayed.
- If this alarm is raised, remove and check the focus lens. If the lens is dirty, clean it. If the dirt cannot be removed, replace the lens.

7-2-3 Programming

Be sure to use G124 and G125 to parenthesize every piercing section of the machining program.

To prevent the lens monitoring function from being activated inappropriately by the reflected light during piercing, place G124 and G125 before and after every piercing section to turn off and on the lens monitoring function.

7-2-4 Torch

Use a Servo Focus torch specified by Mazak.

5" torch, 7.5" torch, and 8.75" torch

(The sensor is installed on the head, but not in the torch. So it works even if the torch is replaced.)

7-2-5 Focus lens

Use a lens specified by Mazak.

7-2-6 Nozzle

Use a nozzle specified by Mazak.

Single nozzles: Nozzle diameter of 1.2 mm (0.047 in) to 4.0 mm (0.156 in)
Dual nozzles: Nozzle diameter of 2.5 mm (0.098 in) to 4.0 mm (0.156 in)

7-2-7 Restrictions and precautions

- Be sure to enter the G124 and G125 codes before and after every piercing section of a machining program. The operation of the lens monitoring function is suspended in sections between G124 and G125. If these G-codes are omitted, an alarm (**LENS ALARM**) may be caused by reflected light during piercing.
- The threshold value and the detection time are factory-set to the values recommended for each torch. The NC unit recognizes the torch using the registered tool data and automatically changes the parameter settings to be used.
- This function may be activated because of a machining failure. To prevent this, machining should be performed under conditions where there is no risk of burning and plasma.
- This function does not work during the automatic measurement of the focal distance of the lens.

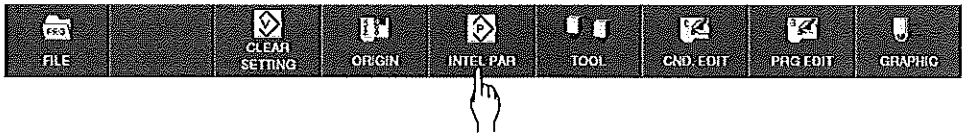
7-3 How to Use

This section describes how to use the lens monitoring function. The lens monitoring function is enabled by default. Here are the steps to be followed to enable or disable this function.

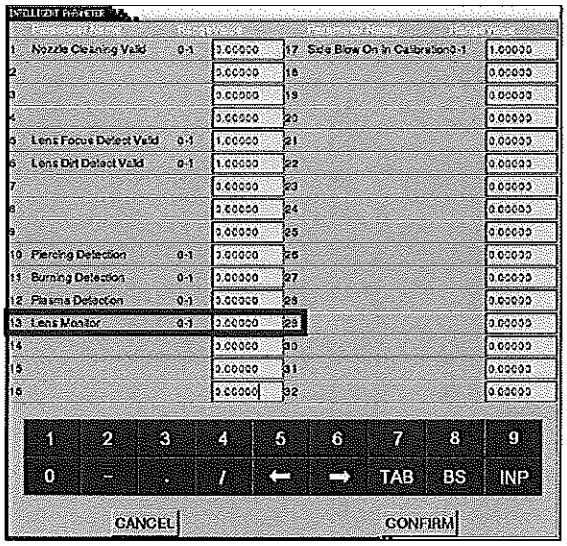
Open the **INTELLIGENT PARAMETER** popup window from the **COMMAND** screen to make this function valid (by setting "1").

(1) Call up the **COMMAND** screen.

(2) Select the **[INTEL PAR]** menu key.



➔ The **INTELLIGENT PARAMETER** popup window appears.



(3) Set "Lens Monitor" to 1 and press the **[CONFIRM]** button.
(This value is linked with the intelligent user parameter **L094**.)

➔ This function becomes enabled.

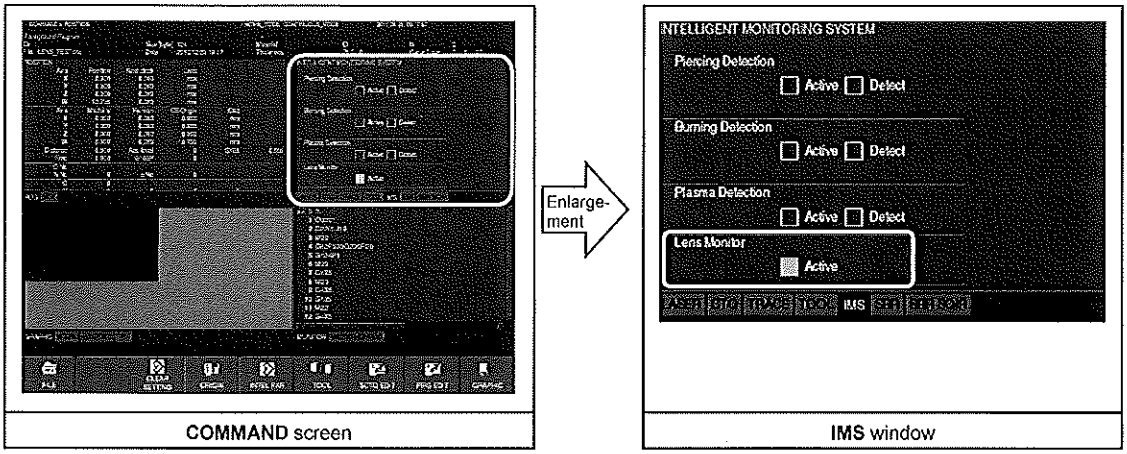
- To disable the lens monitoring function, set "Lens Monitor" to 0 and press the **[CONFIRM]** button.

➔ This function becomes disabled.

7-4 Check as to Whether the Lens Monitoring Function is in Operation

The **IMS** window in the upper right area of the **COMMAND** screen allows you to check whether or not the lens monitoring function is in operation.

When a laser beam is emitted in manual or automatic mode while the lens monitoring function is enabled, the LED indicating that the lens monitoring function is in operation lights up, as shown in the right figure below.



COMMAND screen

IMS window